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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
ORTIZ, BELIX M	

ART UNIT	PAPER NUMBER
2164	

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/050,762	MERUGU ET AL.	
	Examiner	Art Unit	
	Belix M. Ortiz	2164	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,10 and 13-35* is/are rejected.

7)☒ Claim(s) *7-9,11 and 12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

SAM RIMELL
PRIMARY EXAMINER

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Remarks

1. In response to communications files on 9-May-2005, claims 1-5, 7-11, 13-14, 19, 22, and 30 are amended and claims 31-35 are added per applicant's request. Therefore, claims 1-35 are presently pending in the application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-6, 10, 13, and 22-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Venkatachary et al. (U.S. publication 2002/0089937).

As to claim 1, Venkatachary et al. teaches a computer-implemented method for creating and/or modifying a dynamically updateable, searchable packet classification databank (see paragraphs 2, 19, 50, and 64), comprising the steps of:

receiving a collection of packet classification rules, each packet classification rule being represented as a plurality of bit positions (see abstract and paragraphs 4 and 7);

analyzing each of the plurality of bit positions to select a first bit position to partition the collection into at least two sets of siblings, wherein the analyzing includes applying at least one of empirical knowledge or a computed metric foe each bit position to select the first bit position; (see figures 2A-2b and paragraphs 4, 7, 24, 27, and 39)

selecting an index key corresponding to the first bit position (see paragraph 27); and

analyzing each of the plurality of bit positions to select a second bit position to partition the at least two sets of siblings into subsets of siblings (see figures 2A and 2B and paragraphs 30 and 39);

selecting an index key corresponding to the second bit position (see paragraph 30).

As to claim 2, Venkatachary et al. teaches the method further comprising the step of:

selecting an index key corresponding to a third bit position to partition the subsets of siblings into further subsets (see figures 2C and 2D and paragraphs 26 and 39).

As to claim 3, Venkatachary et al. teaches the method further comprising the step of:

repetitively partitioning the subsets of siblings into a hierarchy of subsets at a lower level until reaching a partition threshold (see abstract and paragraphs 26 and 44).

As to claim 4, Venkatachary et al. teaches wherein the partition threshold is predicated on a maximum number of rules residing in a subset of sibling at a respective lower level (see paragraph 44).

As to claim 5, Venkatachary et al. teaches wherein the partition threshold is predicated on a maximum number of respective lower levels (see paragraph 44).

As to claim 6, Venkatachary et al. teaches wherein each sibling at a respective level has a substantially equivalent quantity of the packet classification rules (see paragraphs 63 and 66).

As to claim 10, Venkatachary et al. teaches the method further comprising the step of:

receiving at least one packet classification rule within the collection that has one or more bit positions denoted as having a plurality of values (see figures 2A–2C).

As to claim 13, Venkatachary et al. teaches the method further comprising the steps of:

receiving at least one packet classification rule within the collection that has two or more bit positions that denote a feature having a range of values (see paragraphs 6-7 and 24); and

decomposing the at least one packet classification rule into two or more packet classification divisional rules, wherein the analyzing steps further include processing the divisional rules as part of the collection (see figures 2A-2C and paragraphs 7, 24, and 29).

As to claim 22, Venkatachary et al. teaches a packet classification system, comprising:

a first memory for receiving a collection of packet classification rules, wherein each packet classification rule is represented as a plurality of bit positions (see abstract and paragraphs 3-4 and 7); and

a mask constructor for selecting one or more index keys (see abstract),

wherein each index key corresponds to a bit position that enables partitioning of the packet classification rules into at least two sets of siblings at a lower level (see paragraph 27),

wherein the mask constructor applies at least one of empirical knowledge or a computed metric for each bit position to select the bit position corresponding to each index key (see figure 2A and 2B and paragraphs 4, 7, 24, 27, and 39), and

wherein the mask constructor continues to select index keys to repetitively partition each set of siblings at a respective level into at least two sets of siblings at a lower level until reaching a partition threshold (see figures 2A-2C and paragraph 39).

As to claim 23, Venkatachary et al. teaches wherein the mask constructor assembles the one or more index keys into a query key (see abstract).

As to claim 24, Venkatachary et al. teaches the system further comprising:

a key extractor for applying the query key to produce a refined rule collection from the collection located within the first memory (see abstract and paragraphs 3-4 and 7); and

a second memory for storing the refined rule collection (see paragraph 3).

As to claim 25, Venkatachary et al. teaches wherein the second memory is a content addressable memory (see paragraph 3).

As to claim 26, Venkatachary et al. teaches the system further comprising:

a key extractor for applying the query key to an incoming packet to produce a packet key (see paragraph 7).

As to claim 27, Venkatachary et al. teaches the system, further comprising:

a packet classifier for applying the packet key to detect a packet classification rule matching the packet key (see abstract).

As to claim 28, Venkatachary et al. teaches wherein the key extractor is a multiplexor, wherein the multiplexor is configured to select field descriptors from the packet based on the query key (see paragraph 30).

As to claim 29, Venkatachary et al. teaches wherein the multiplexor is a crossbar switch or a bit shifter (see figure 2A and paragraph 26-27 and 30).

As to claim 30, Venkatachary et al. teaches a computer program product comprising a computer useable medium having computer readable program code means embedded in the medium for causing a computer to classify packet flows (see abstract and paragraphs 2 and 64), comprising:

a first computer readable program code means for causing the computer to select one or more index keys (see paragraph 6),

wherein the first computer readable program code means selects each index key such that each index key corresponds to a bit position that enables partitioning of a set of packet classification rules into two or more sets of siblings at a lower level (see paragraphs 27, 30, and 39)

wherein the first computer readable program code means applies at least one of empirical knowledge or a computed metric for each location to select the bit position corresponding to each index key (see figures 2A and 2B and paragraphs 4, 7, 24, 27, and 39), and

wherein the first computer readable program code means continues to select index keys to repetitively partition each set of siblings at a respective level into at least two sets of siblings at a lower level until reaching a partition threshold (see abstract and paragraphs 26 and 44); and

a second computer readable program code means for causing the computer to assemble the one or more index keys into a query key (see paragraph 6).

As to claim 31, Venkatachary et al. teaches a computer-implemented method for creating and/or modifying a dynamically update-able, searchable packet classification databank (see paragraphs 2, 19, 50, and 64), comprising the steps of:

receiving a collection of packet classification rules, each packet classification rule being represented as a plurality of location coordinates (see abstract and paragraphs 4 and 7);

selecting an index key based on a common location coordinate among the packet classification rules at a first level, such as to enable partitioning of said collection into two or more siblings at a second level, wherein the coordinate value of said common location coordinate represents a feature whereby the composition of each sibling contains packet classification rules possessing a common feature (see abstract; figures 2A-2C; and paragraphs 16 27); and

selecting an index key based on a second common location coordinate among said packet classification rules at said second level, such as to enable partitioning of at least one of said two or more siblings at said second level into two or more siblings at a third level (see figures 2A and 2B and paragraphs 30 and 39),

wherein each of said selecting an index key step comprises the steps of:

measuring a difference in cardinality at each location coordinate that has not been selected previously as an index key (see figures 2B and 2C); and

computing an optimization parameter for each location coordinate (see paragraphs 62-64).

As to claim 32, Venkatachary et al. teaches wherein each of said selecting an index key step further comprises the step of:

selecting an index key corresponding to a location coordinate having an optimization parameter closest to a predetermined value (see claim 22 and paragraphs 62-64).

As to claim 33, Venkatachary et al. teaches wherein each of said selecting an index key step further comprises the step of:

selecting an index key corresponding to a first location coordinate determined to have an optimization parameter closest to a predetermined value in response to determining multiple location coordinates having an optimization parameter closest to a predetermined value (see figures 2A-2C and paragraph 27).

As to claim 34, Venkatachary et al. teaches a computer-implemented method for creating and/or modifying a dynamically update-able (see abstract and paragraphs 2, 19, 540, and 64), searchable packet classification databank, comprising the steps of:

receiving a collection of packet classification rules, each packet classification rule being represented as a plurality of location coordinates (see abstract and paragraphs 4 and);

receiving at least one packet classification rule within said collection that has one or more location coordinates denoted as having a plurality of values (see abstract and figures 2A-2C 7);

selecting an index key based on a common location coordinate among said packet classification rules at a first level, such as to enable partitioning of said collection into two or more siblings at a second level, wherein the coordinate value of said common location coordinate represents a feature whereby the composition of each sibling contains packet classification rules possessing a common feature (see abstract; figures 2A-2C; and paragraphs 16 27); and

selecting an index key based on a second common location among said packet classification rules at said second level, such as to enable partitioning of at least one of said two or more siblings at said second level into two or more siblings at a third level (see figures 2A and 2B and paragraphs 30 and 39),

wherein each of said selecting an index key step comprises the steps of:

measuring a difference in cardinality at each location coordinate that has not been selected previously as an index key (see figures 2B and 2C); and

computing an optimization parameter for each location coordinate (see paragraphs 62-64).

As to claim 35, Venkatachary et al. teaches wherein said computing an optimization parameter comprises:

determining an evenness of division for siblings at a respective level (see figures 2A-2D); and

determining an average cardinality (see figures 2A-2D).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 14-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Venkatachary et al. (U.S. patent 2002/0089937) in view of Carr et al. (U.S. patent 6,600,744).

As to claim 14, Venkatachary et al. does not teach the method further comprising the step of:

manifesting a query key based on index keys selected to partition the packet classification rules.

Carr et al. teaches a method and apparatus for packet classification in a data communication system (see abstract), in which he teaches the method further comprising the step of:

manifesting a query key based on index keys selected to partition the packet classification rules (see figure 4, character "400").

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Venkatachary et al., to include the method further comprising the step of:

manifesting a query key based on index keys selected to partition the packet classification rules.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Venkatachary et al. by the teaching of Carr et al., because the method further comprising the step of:

manifesting a query key based on index keys selected to partition the packet classification rules, would enable the method, because the partitioning process is initiated to construct the extraction function and the extraction function is selected as the index key.

As to claim 15, Venkatachary et al. as modified teaches the method further comprising the steps of:

enabling addition and/or deletion of a packet classification rule in the collection (see Venkatachary et al, paragraphs 7 and 50); and

revising the query key in response to the addition and/or deletion of a packet classification rule (see Venkatachary et al., paragraph 50).

As to claim 16, Venkatachary et al. as modified teaches the method further comprising the step of:

performing the revising the query key on a periodically scheduled basis (see Carr et al., column 11, lines 7-15).

As to claim 17, Venkatachary et al. as modified teaches the method further comprising the step of:

performing the revising the query key on demand (see Carr et al., figure 4, character "400").

As to claim 18, Venkatachary et al. as modified teaches the method further comprising the steps of:

receiving a packet (see Venkatachary et al., claim 13 and paragraph 6);

applying the query key to the packet to produce a packet key (see Venkatachary et al., paragraph 6); and

searching the collection to detect a packet classification rule matching the packet key (see Venkatachary et al., paragraph 6).

As to claim 19, Venkatachary et al. as modified teaches the method further comprising the steps of:

detecting multiple packet classification rules matching the packet key (see Venkatachary et al., abstract); and

selecting a collision location key based on a common location to enable partitioning of the multiple packet classification rules (see Venkatachary et al., figure 2B).

As to claim 20, Venkatachary et al. as modified teaches the method further comprising the steps of:

detecting multiple packet classification rules matching the packet key (see Venkatachary et al., abstract); and

sequentially comparing each of the multiple packet classification rules with the packet to detect a matching rule (see Venkatachary et al., abstract; figure 2B; and paragraph 2).

As to claim 21, Venkatachary et al. as modified teaches the method further comprising the step of:

enabling addition and/or deletion of a packet classification rule in the collection during the searching the collection (see Venkatachary et al., paragraphs 7 and 50).

Allowable Subject Matter

6. Claims 7-9 and 11-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record, Venkatachary et al. (U.S. patent 2002/0089937), Carr et al. (U.S patent 6,600,744), do not disclose, teach, or suggest the claimed limitations of (in combination with all other features in the claim):

wherein each of the selecting an index key step comprises the steps of:

measuring a difference in cardinality at each location coordinate that has not been selected previously as an index key; and

computing an optimization parameter for each location coordinate, as claimed in claim 7.

Claims 8-9 are objected to as being dependent from the objected to dependent claim 7.

The prior art of record, Venkatachary et al. (U.S. patent 2002/0089937), Carr et al. (U.S patent 6,600,744), do not disclose, teach, or suggest the claimed limitations of (in combination with all other features in the claim):

wherein each of the selecting an index key step comprises the steps of:

measuring a difference in cardinality at each location coordinate that has not been selected previously as an index key; and

computing an optimization parameter for each location coordinate, as claimed in claim 11.

The prior art of record, Venkatachary et al. (U.S. patent 6567,408), Carr et al. (U.S patent 2002/0089937), do not disclose, teach, or suggest the claimed limitations of (in combination with all other features in the claim):

wherein the computing an optimization parameter comprises:

determining an evenness of division for siblings at a respective level; and

determining an average cardinality, as claimed in claim 12.

Response to Arguments

8. Applicant's arguments filed 9-May-2005 with respect to the rejected claims in view of the cited references have been fully considered but they are not found persuasive:

In response to applicants' arguments new rejection was applied on the Action.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Belix M. Ortiz whose telephone number is 571-272-4081. The examiner can normally be reached on moday-friday 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dov Popovici can be reached on 571-272-4083. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

bmo

June 9, 2005.

SAM RIMELL
PRIMARY EXAMINER